

Remarks/Arguments

The Examiner is thanked for the careful review of this Application. Claims 1-20 are pending after entry of the present Request for Reconsideration. No new matter has been introduced.

Objections:

The Office has objected to claims 2-10 and 17-20, stating that "A MRAM" should be changed to "The MRAM" in line 1. The Office has also objected to claims 12-15, stating that "A method" should be changed to "The method" in line 1. Applicants thank the Office for these suggestions. However, Applicants think that the existing claim language meets the requirement of 35 U.S.C. § 112 for clearly defining the claimed subject matter. If the Office has different opinion on this matter, it is respectfully requested to point out the rule that requires the suggested change. Upon reviewing such a rule, Applicants would be glad to amend the claims in the manner suggested by the Office.

Rejections under 35 U.S.C. § 102:

The Office has rejected claims 1-3, 6-11 and 13-20 under 35 U.S.C. § 102(e) as being anticipated by United States Patent No. 6,538,918 to *Swanson et al.* For at least the following reasons, the Applicants submit that *Swanson et al.* fails to disclose each and every feature of independent claims 1, 11, and 16.

Regarding independent claims 1 and 16, *Swanson et al.* teaches a bit structure 10 for a memory cell formed directly on an insulating layer 13 over a semiconductor body 12 in Figure 1. In Figure 1, there is a word line 19, isolated from the bit structure 10 by an insulating layer 18. However, bit structure 10 is not a bit line. A bit structure is part of a single memory cell, while a bit line must be connected to multiple memory cells. Therefore, the bit structure 10 is not a bit line. As a consequence, *Swanson et al.* does not teach a bit line perpendicular to the word line, as defined in claims 1 and 16.

In addition, layer 18 is an insulating layer, which isolates word line 19 from bit structure 10. The insulating layer 18 is not a magnetic device and is not made of magnetic material. Insulating layer 18 covers bit structure 10 and is under the entire word line 19. Insulating layer 18 is not disposed at an intersection of word line 19 and bit structure 10. Further, the description of Figure 1 states that Figure 1 only shows a part of insulating layer 18 and does not describe insulating layer 18 as having a first end and a second end. Support

for the Applicants' interpretation can be found in several excerpts of *Swanson et al.* For instance, in column 2, lines 16-18, *Swanson et al.* provides:

An insulating layer 18 covers bit structure 10 although only a part of it is shown in FIG. 1. Finally, a word line 19 is shown in FIG. 1 disposed on the major surface of insulating layer 18.

For the reasons set forth above, *Swanson et al.* does not teach a magnetic device disposed at an intersection of the word line and the bit line, with the magnetic device having a first end and a second end, as defined in claims 1 and 16.

The Office further asserts that *Swanson et al.* teaches a pair of writing magnets in structure 16 of Figure 1. However, structure 16 is a ferromagnetic thin film layer, which is part of the bit structure 10, which in turn is under the insulating layer 18 and part of the word line 19. Structure 16 is not a pair of writing magnets. (*See*, col. 1, lines 42-45, col. 2, lines 9-17, and Figure 1) Applicants respectfully disagree with the statement by the Office that column 2, lines 9-19 describe "two of writing magnets 16 located two ends, and separated by insulator 18." The ferromagnetic thin film layer 16, which is the top layer of bit structure 10, is a single structure and is not two writing magnets. Layer 16 is covered by layer 18, and therefore cannot be two magnets separated by layer 18.

Accordingly, independent claims 1 and 16 are patentable under 35 U.S.C. § 102(e) over *Swanson et al.* In a like manner, dependent claims 2-3, 6-10, and 17-20, each of which directly or indirectly depends from the applicable independent claim, are patentable under 35 U.S.C. § 102(e) over *Swanson et al.* for at least the reasons set forth above regarding the respective independent claim.

Regarding independent claim 11, *Swanson et al.* does not teach a bit line; therefore, *Swanson et al.* cannot teach "supplying a current to a word line and a bit line of the MRAM cell," and "generating a magnetic field using the current in the word line and the bit line," as defined in claim 11. The arguments regarding *Swanson et al.* teaching a bit structure 10 and not teaching a bit line are discussed above with regard to independent claims 1 and 16. In addition, *Swanson et al.* does not teach "a pair of writing magnets disposed at either end of a magnetic device," as defined in claim 11. The arguments are also discussed above with regard to independent claims 1 and 16. Accordingly, independent claim 11 is patentable under 35 U.S.C. § 102(e) over *Swanson et al.* In a like manner, dependent claims 13-15, each of which directly or indirectly depends from independent claim 11, are patentable under 35 U.S.C. § 102(e) over *Swanson et al.* for at least the reasons set forth above regarding the independent claim.

The Office has also rejected claims 1-3, 6-11 and 13-20 under 35 U.S.C. § 102(e) as being anticipated by United States Publication No. 2005/0105328 to *Ho*. For at least the following reasons, the Applicants submit that *Ho* fails to disclose each and every feature of independent claims 1, 11, and 16.

Regarding independent claims 1 and 16, *Ho* teaches a MRAM structure 200 including a plurality of unit cells 100. *Ho* teaches bit lines 202 and word lines 204, and a magnetic device 106 disposed at the intersection of a word line and a bit line. However, *Ho* does not teach a pair of writing magnets, as defined in claims 1 and 16. The Office asserts that *Ho* teaches a pair of writing magnets 102 in Figure 1. However, structures 102 are μ -metal regions connecting the magnetic device 106 to bit lines 202 and word lines 204. A pair of μ -metal regions 102 does not constitute a pair of writing magnets. Support for the Applicants' interpretation can be found in several excerpts of *Ho*. For instance, in paragraph [0027], *Ho* provides:

The exemplary unit cell 100 includes an MTJ device 106, disposed between two metal spacers 104, and two μ -metal regions 102.

Based on the foregoing excerpt and illustration of Figure 1, *Ho* does not teach a pair of writing magnets. The Office also asserts that Figure 10 shows a pair of write magnets. However, the description of Figure 10 states that Figure 10 is a diagram showing exemplary properties of MRAM cells and refers to the μ -metal and spacer of Figure 1. There is no reason to speculate that Figure 10 is showing properties of MRAM cells that are different from the one shown in Figure 1.

In addition, *Ho* teaches that between the μ -metal regions 102 and the magnetic device 106 are the metal spacers 104, which are made of metal. However, claims 1 and 16 define that one of the write magnets is separated from the end of the magnetic device by an insulator. Metal spacer 104 is made of metal and therefore is not made of an insulator. Therefore, *Ho* does not teach that one of the write magnets is separated from the end of the magnetic device by an insulator, defined in claims 1 and 16.

Accordingly, independent claims 1 and 16 are patentable under 35 U.S.C. § 102(e) over *Ho*. In a like manner, dependent claims 2-3, 6-10 and 17-20, each of which directly or indirectly depends from the independent claim, are patentable under 35 U.S.C. § 102(e) over *Ho* for at least the reasons set forth above regarding the independent claim.

Regarding independent claim 11, *Ho* does not teach "wherein the magnetic field is applied to a pair of writing magnets disposed at either end of a magnetic device," as defined in claim 11. The arguments regarding *Ho* not teaching a pair of writing magnets are detailed above in connection with independent claims 1 and 16. *Ho* teaches two μ -metal regions 102

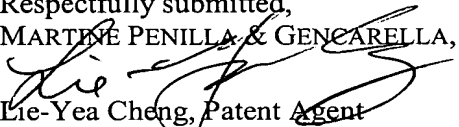
at the two ends of the magnetic device 106. Currents are applied to two μ -metal regions 102, not a magnetic field as in the claimed subject matter.

Accordingly, independent claim 11 is patentable under 35 U.S.C. § 102(e) over *Ho*. In a like manner, dependent claims 13-15, each of which directly or indirectly depends from the independent claim, are patentable under 35 U.S.C. § 102(e) over *Ho* for at least the reasons set forth above regarding the independent claim.

Indication of Allowability:

The Applicants hereby acknowledge the allowability of claims 4 and 12.

As such, the Applicants respectfully request examination on the merits of the subject application, and submit that all of the pending claims are in condition for allowance. Accordingly, a notice of allowance is respectfully requested. If the Examiner has any questions concerning the present Request for Reconsideration, the Examiner is kindly requested to contact the undersigned at (408) 774-6924. If any additional fees are due in connection with filing this Request for Reconsideration, the Commissioner is also authorized to charge Deposit Account No. 50-0805 (Order No. MXICP024). A duplicate copy of the transmittal is enclosed for this purpose.

Respectfully submitted,
MARTINE PENILLA & GENCARELLA, LLP

Lie-Yea Cheng, Patent Agent
Reg. No. 52,732

710 Lakeway Drive, Suite 200
Sunnyvale, CA 94085
Telephone (408) 774-6924
Facsimile (408) 749-6901
Customer No. 25920